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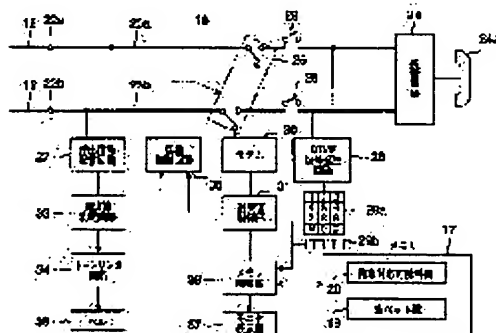
(54) EMERGENCY MEDICAL INFORMATION TERMINAL EQUIPMENT

(57)Abstract:

PROBLEM TO BE SOLVED: To improve the reliability of the medical information system by receiving a polling request from an emergency medical information center with precedence over other usual speech request so as to improve the operability.

SOLUTION: A host computer of an emergency medical information center sends a polling request corresponding to information dealing with emergency to an information terminal equipment of each medical agency once a day, for example, to collect current information dealing with emergency. An exchange references a specific telephone number table to send a specific frequency call signal whose frequency is, e.g. 2100Hz only to a polling request of information dealing with emergency. A

frequency discrimination circuit 33 receives a call signal received via a telephone line 12 via a call signal reception circuit 27 to discriminate the frequency. When the frequency of the call signal is 2100Hz, a changeover control circuit 36 controls a changeover switch 25 to connect the telephone line 12 to a MODEM 30. In this case, a tone ringer 34 stops call tone ringing.



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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] The circuit diagram showing the outline configuration of the emergency medical service information terminal unit concerning 1 operation gestalt of this invention

[Drawing 2] The mimetic diagram showing the whole emergency medical information system with which this operation gestalt equipment was incorporated

[Drawing 3] Drawing showing the specific telephone number table formed in the exchange of this emergency medical information system

[Drawing 4] The external view showing this operation gestalt equipment

[Drawing 5] The flow chart showing the whole actuation in this operation gestalt equipment

[Drawing 6] The mimetic diagram showing the emergency medical information system with which the conventional information terminal unit was incorporated

[Description of Notations]

1 -- An emergency medical service information center, 4 -- A host computer, 5 -- Telephone, 11 [-- Information terminal unit,] -- The exchange, 12 -- The telephone line, 13 -- A medical institution, 18 17 [-- Handset,] -- Memory, 21 -- A specific telephone number table, 24 -- A speaking circuit, 24a 25 [-- A dialing key, 29b / -- A function key, 30 / -- A modem, 31 / -- The transmit/receive control section, 33 / -- A frequency judging circuit, 36 / -- A change-over control circuit, 37 / -- A monitor drop, 38 / -- Memory control section] -- A change-over circuit, 26 -- A hook switch, 27 -- A call signal receiving circuit, 29a

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] Especially this invention relates to amelioration of the emergency medical service information terminal unit installed in each medical institution with respect to an emergency medical information system.

[0002]

[Description of the Prior Art] Generally, in each local self-governing body, the emergency medical information system using a general public line network is built as part of the medical service to the residents in the administration area of self.

[0003] Drawing 6 is the outline block diagram of an emergency medical information system. For example, the various medical institutions 2, such as a hospital which exists in this self-governing body, are connected through the telephone line 3 to the emergency medical service information center 1 installed in the medical association etc., respectively.

[0004] The emergency medical service information center 1 is carrying out storage maintenance of the information corresponding to emergency, such as the number of empty beds of each medical institution 2, and a subject corresponding to emergency, into the host computer 4. And if the notice of the generating information of a fire department, a police station, or the emergency patient from a general citizen is received, for example, the medical institution 2 which can accept an applicable patient will be chosen based on the information corresponding to the emergency memorized in the host computer 4, and a report person will be answered in the selection result.

[0005] The fire department, police station, or general citizen to whom the medical institution 2 of an acceptance place was told from the emergency medical service information center 1 conveys to the medical institution 2 to which the applicable emergency patient was directed. Since the number of empty beds and the subject corresponding to emergency in each medical institution 2 are changed frequently, the host computer 4 of the emergency medical service information center 1 transmits the polling demand to the information corresponding to emergency through the telephone line 3 to the information terminal unit 7 of each medical institution 2 with fixed periods, such as 1 etc. time per, day.

[0006] The information terminal unit 7 of each medical institution 2 has the auto-receipt of the data through the modem other than the usual telephone function, and the automatic-transmission function of data. And the information terminal unit 7 will transmit the information corresponding to the emergency which is carrying out storage maintenance to the host computer 4 of the emergency medical service information center 1 through the telephone line 3 at the storage circles of self, if the polling demand from the host computer 4 of the emergency medical service information center 1 is received through a modem.

[0007] The host computer 4 of the emergency medical service information center 1 transmits a polling demand in order to each medical institution 2 at intervals of predetermined time required for reception of transmission of a polling demand, and the information corresponding to emergency, collects each information corresponding to emergency one by one from each medical institution 2, and updates the

information corresponding to the emergency memorized by the self file to the newest information.

[0008] In such an emergency medical information system, if a medical institution 2 is chosen based on the information corresponding to the emergency memorized in the host computer 4, the operator of the emergency medical service information center 1 will telephone the information terminal unit 7 of a medical institution 2 chosen by telephone 5 for the check, will tell the purport toward which an emergency patient tends to the operator who is near the information terminal unit 7, and will answer a report person in the selection result after that.

[0009]

[Problem(s) to be Solved by the Invention] However, the following technical problems which should still be improved occurred also in the emergency medical information system of a configuration of having mentioned above. The information terminal unit 7 arranged in each medical institution 2 has the auto-receipt function and automatic-transmission function through the modem other than the usual telephone function of data, as mentioned above.

[0010] Therefore, if a 16Hz call signal receives a message from the outside through the telephone line 3, as for this call signal, distinction of the polling demand from a host computer 4 and the message demand from the common telephone 5 is not attached.

[0011] If it generally passes as a procedure of the automatic incoming connection using a modem during the 1 scheduled time when the 16Hz call signal was defined beforehand, the telephone line will be switched to a modem side, automatic incoming connection will be carried out as auto-answer mode, and a communication line will be formed between the computers of a sending agency. And through this formed communication line, the polling demand from the computer of a sending agency is received, and the access processing to the information corresponding to the emergency memorized by the storage section of self based on this polling demand is started.

[0012] However, for the operator who is near this information terminal unit 7, a handset (hand set) is taken up accidentally [demand / polling] with the message demand from common telephone, and there is concern which carries out the forcible change-over of the telephone line at a speaking circuit side.

[0013] Since there is no response to a polling demand as a host computer 4 of the emergency medical service information center 1 of the transmitting side of a polling demand when the forcible change-over of the telephone line is carried out at a speaking circuit side, it is judged that the information terminal unit 7 of the applicable medical institution 2 is unusual. And the information gathering processing to the next medical institution 2 is started. Termination of the information gathering processing to all the medical institutions 2 transmits a polling demand again to the medical institution 2 which was not able to gather information first.

[0014] If an operator takes up a handset (hand set) accidentally and answers at this time, as a host computer 4 of the emergency medical service information center 1, information gathering will go wrong twice from the applicable medical institution 2, and the 3rd information gathering will be stopped.

[0015] Therefore, the information corresponding to emergency of the applicable medical institution 2 memorized by the self file is not updated correctly, and the problem which cannot offer information corresponding to right emergency to the fire department, police station, or general citizen of a reference arises.

[0016] Furthermore, in the limitation which hears ringing tone, although ** polling implementation time of day is once set up also for the operator near the information terminal unit 7 of a medical institution 2, since a polling demand and a message demand are undistinguishable, there is concern which performs mistaken correspondence and it is very troublesome.

[0017] While this invention can answer certainly to a polling demand, can transmit the information corresponding to emergency to an emergency medical service information center certainly and can improve the dependability of the whole emergency medical information system by being made in view of such a situation and stopping the singing of ringing tone automatically to the polling demand by the computer, it aims at offering the emergency medical service information terminal unit which an operator can answer certainly only to a message demand, and can mitigate an operator's mental burden.

[0018]

[Means for Solving the Problem] It connects through the telephone line to the computer and the telephone of an emergency medical service information center, and this invention carries out automatic incoming connection of the polling demand through the telephone line from the computer of an emergency medical service information center through a modem, and it is applied to the emergency medical service information terminal unit which performs manual arrival using a speaking circuit according to the message demand through the telephone line from the telephone of an emergency medical service information center while it considers information corresponding to emergency as a polling response and transmits it automatically to the computer of an emergency medical service information center.

[0019] And the emergency medical service information terminal unit mentioned above in order to cancel the above-mentioned technical problem is received. The means for switching which switches the telephone line to a speaking circuit or a modem, and a call signal receiving means to receive the call signal which received a message through the telephone line, A frequency measurement means to measure the frequency of the call signal received with the call signal receiving means, A line control means to send out the change-over signal which connects the telephone line to a speaking circuit side when the frequency measured with the frequency measurement means is a regular call signal frequency, and connects the telephone line to a modem when it is the specific frequency as which the frequency was determined beforehand to a means for switching, When the frequency measured with the frequency measurement means is a specific frequency, it has a ring trip means to stop the singing of ringing tone.

[0020] In the emergency medical service information terminal unit of such a configuration, as for the frequency of the call signal which received a message through the telephone line, the normal frequency of 16Hz and the specific frequency of 2100Hz exist.

[0021] In the exchange installed in the dial office, when registering the specific sending agency telephone number and the specific transmission place telephone number and calling a telephone terminal with the specific transmission place telephone number from the telephone terminal of the sending agency telephone number of said specification, it specifically restricts, and the call signal of said specific frequency is sent out from the exchange to a transmission place telephone terminal.

[0022] And in this invention, the specific sending agency telephone number is made into the telephone number of the computer of an emergency medical service information center, and the specific transmission place telephone number is made into the telephone number of the emergency medical service information terminal unit of this application.

[0023] Therefore, as an emergency medical service information terminal unit of a receiving side, what this call signal depends on a polling demand from the computer of an emergency medical service information center, and the thing depended on a message demand from common telephone is easily distinguishable by detecting the frequency of a call signal. And since automatic incoming connection of the case of a polling demand is carried out through a modem by switching the telephone line to a modem side, the singing of ringing tone has been stopped.

[0024] Therefore, the operator near this emergency medical service information terminal unit takes up a handset accidentally, and does not answer a polling demand from the computer of an emergency medical service information center. On the other hand, in the usual message demand, singing of the ringing tone is usually carried out to a passage, and an operator is told about it.

[0025]

[Embodiment of the Invention] The operation gestalt of this invention is explained using a drawing below. Drawing 2 is the outline block diagram of the emergency medical information system with which the emergency medical service information terminal unit of an operation gestalt was incorporated. The same sign is given to the same part as the conventional emergency medical information system shown in drawing 6. Therefore, detail explanation of the overlapping part is omitted.

[0026] Each medical institution 13, such as a hospital, is connected through the exchange 11 and the telephone line 12 of a dial office to the emergency medical service information center 1. In the emergency medical service information center 1, the host computer 4 which carries out storage maintenance of the information corresponding to emergency, such as the number of empty beds of each

medical institution 13 and a subject corresponding to emergency, into a file, and the common telephone 5 are incorporated.

[0027] In addition, and a host computer 4 and telephone 5 have the telephone number according to individual, respectively, it becomes independent, respectively and a line connection is possible for them to each medical institution 13.

[0028] If the notice of the generating information of a fire department 14, a police station 15, or the emergency patient from the general citizen 16 is received, the emergency medical service information center 1 will choose the medical institution 13 which can accept an applicable patient based on the information corresponding to the emergency memorized by the file in a host computer 4, and will answer a report person in the selection result. The fire department, police station, or general citizen to whom the medical institution 2 of an acceptance place was told from the emergency medical service information center 1 conveys to the medical institution 2 which had the emergency patient specified.

[0029] On the other hand, in each medical institution 13, the emergency medical service information terminal unit (it is written as an information terminal unit below) 18 of this application operation gestalt is formed. The information corresponding to emergency on the subject 20 grade corresponding to emergency which shows the correspondence subject which can accept the 19 present empty beds and the emergency patient at the present time in the memory 17 of this information terminal unit 18 as shown in drawing 1 is carrying out storage maintenance into the file.

[0030] And this information terminal unit 18 is connected to the exchange 11 of a dial office through the telephone line 12. The information terminal unit 18 has the one telephone number. The exchange 11 of a dial office sends out a call signal with the normal frequency of 16Hz as opposed to the subscriber telephone terminal of the message place telephone number, if a message is received from a subscriber telephone terminal in the communication link demand which specified the message place telephone number. And if the handset of the subscriber telephone terminal of the message place telephone number is taken up and a line of contact is formed, sending out of a call signal will be stopped.

[0031] Moreover, in this exchange 11, the specific telephone number table 21 shown in drawing 3 is formed. Into this specific telephone number table 21, the combination of the specific sending agency telephone number and the specific transmission place telephone number is registered.

[0032] And the exchange 11 is restricted when calling a subscriber telephone terminal with the specific transmission place telephone number from the subscriber telephone terminal of the specific sending agency telephone number registered into this specific telephone number table 21, and it sends out a call signal with the specific frequency of 2100Hz as opposed to a transmission place telephone terminal from the exchange 11.

[0033] In this operation gestalt, the telephone number of the host computer 4 of the emergency medical service information center 1 is registered as the specific sending agency telephone number, and the telephone number of each information terminal unit 18 of each medical institution 13 is registered as the specific transmission place telephone number. However, the telephone number of the telephone 5 of the emergency medical service information center 1 is not registered into this specific telephone number table 21.

[0034] Since 19 empty beds and the subject 20 corresponding to emergency in each medical institution 13 change frequently as mentioned above, the host computer 4 of the emergency medical service information center 1 transmits the polling demand to the information corresponding to emergency to the information terminal unit 18 of each medical institution 13 with fixed periods, such as 1 etc. time per, day. And the current information corresponding to emergency of each medical institution 13 is collected.

[0035] Drawing 4 is the external view of the information terminal unit 18 installed in each medical institution 13. Handset (hand set) 24a is arranged on the left-hand side of the top face of the information terminal unit 18 with the almost same configuration as a common multi-function telephone terminal, and various function key 29b for performing dialing key 29a and a selection of function and the monitor drop 37 are *****(ed) by right-hand side.

[0036] Moreover, drawing 1 is the circuit diagram showing the outline configuration of this information

terminal unit 18. The speaking circuit 24 where handset (hand set) 24a was connected to the input terminals 22a and 22b to which the telephone line 12 of the exchange 11 was connected through signal lines 23a and 23b is connected. Furthermore, the change-over circuit 25 and the hook switch 26 are inserted to signal lines 23a and 23b. The hook switch 26 is wide opened in the normal state, and if an operator takes up handset 24a, it will be closed.

[0037] The call signal receiving circuit 27 and the DTMF signal generating circuit 28 are connected signal-line 23a and between 23b. The DTMF signal generating circuit 28 sends out the DTMF signal corresponding to dial actuation of dialing key 29a to the telephone line 12 through signal lines 23a and 23b.

[0038] A speaking circuit 24 is connected to one side of the change-over circuit 25 through a hook switch 26, and the transmit/receive control section 31 is connected to another side through the modem 30. The memory control section 38 which performs the writing and read-out of data to the memory 17 which memorized the information corresponding to the emergency mentioned above is connected to this transmit/receive control section 31. The keying signal from said dialing key 29a and function key 29b is also inputted into this memory control section 38. Furthermore, said monitor drop 37 is connected to this memory control section 38.

[0039] Moreover, said call signal receiving circuit 27 detects the frequency of the call signal which received a message from the exchange 11 through the telephone line 12, and transmits it to the frequency judging circuit 33. The frequency judging circuit 33 judges the frequency of the call signal detected in the call signal receiving circuit 27, when it is the normal frequency whose applicable frequency is 16Hz, starts a bell 35 through the tone ringer circuit 34, and carries out singing of the ringing tone.

[0040] On the other hand, the frequency judging circuit 33 sends out the change-over signal which switches signal lines 23a and 23b to a modem 30 side from a speaking circuit 24 side to the change-over control circuit 36, without driving the tone ringer circuit 34, when the frequency of a call signal is a specific frequency which is 2100Hz.

[0041] Automatic incoming connection of the modem 30 is carried out to the 2100Hz call signal inputted through the change-over circuit 25, and it forms a communication line between the host computers 4 of the emergency medical service information center 1 of a sending agency. Moreover, a modem 30 intercepts a communication line according to the circuit disconnect command from the transmit/receive control section 31.

[0042] The transmit/receive control section 31 connected to the modem 30 is sent out to the following memory control section 38, if the polling demand from the host computer 4 of the emergency medical service information center 1 is received through a modem 30. The memory control section 38 reads the information corresponding to the emergency which consists of 19 current empty beds and the possible subject 20 corresponding to emergency which are memorized by memory 17, and transmits to the host computer 4 of the emergency medical service information center 1 through the transmit/receive control section 31 and a modem 30 while it displays the polling demand which received on the monitor indicator 37.

[0043] The transmit/receive control section 31 sends out the change-over discharge signal which returns signal lines 23a and 23b to the original speaking circuit 24 side from a modem 30 side to the change-over control circuit 36 while sending out a circuit disconnect command to a modem 30, after transmitting processing of the information corresponding to emergency is completed.

[0044] The change-over control circuit 36 returns signal lines 23a and 23b to a speaking circuit 24 side from a modem 30 side according to the change-over discharge signal from the transmit/receive control section 31 while switching signal lines 23a and 23b to a modem 30 side from a speaking circuit 24 side according to the change-over signal from the frequency judging circuit 33.

[0045] Moreover, the memory control section 38 is the period which is not carrying out polling response processing between the host computers 4 of the emergency medical service information center 1. and the condition, i.e., condition that the hook switch 26 was opened wide, that handset 24a was placed An operator updates the subject 20 and 19 empty beds corresponding to emergency medical service which

were memorized by memory 17 to the newest information based on the updating command of the subject 20 corresponding to emergency medical service and 19 empty beds which were inputted by the combination key stroke of function key 29b and dialing key 29a.

[0046] Therefore, into the memory 17 of this information terminal unit 18, storage maintenance of the newest information corresponding to emergency is always carried out. Thus, it explains using the flow chart showing the constituted actuation by the whole information terminal unit 18 in drawing 5.

[0047] If the call signal through the telephone line 12 is received from the exchange 11 based on the polling demand from the host computer 4 of the emergency medical service information center 1, in P (program step) 1, it will be judged with the specific frequency of 2100Hz in the call signal receiving circuit 27 and the frequency judging circuit 33. Then, the change-over circuit 25 switches to a modem 30 side, and does not carry out singing of the ringing tone (P2).

[0048] And automatic incoming connection is carried out to a 2100Hz call signal with a modem 30 (P3); and the transmit/receive control section 31 and the memory control section 38 carry out response processing to a polling demand (P4). Then, a communication line is intercepted, the change-over circuit 25 is returned to the original speaking circuit 24 side, and this communications processing is ended (P5).

[0049] On the other hand, from the common subscriber telephone containing the telephone 5 of the emergency medical service information center 1, if the call signal through the telephone line 12 is received from the exchange 11 based on a message demand, in P(program step) 1, it will be judged with the general normal frequency of 16Hz in the call signal receiving circuit 27 and the frequency judging circuit 33. In this case, the change-over circuit 25 carries out singing of the ringing tone, without switching (P6). And if an operator takes up handset 24a, a hook switch 26 will be closed and a line of contact will be formed between a speaking circuit 24 and the telephone 5 of a sending agency (manual arrival P7). And a speaking circuit will be intercepted, if a general message is performed between an operator and a phase hand (P8) and either places a handset. And this message processing is ended (P5).

[0050] Thus, in the constituted emergency medical information system, in order that the host computer 4 of the emergency medical service information center 1 may collect the information corresponding to emergency of each medical institution 13, when a polling demand is transmitted to the information terminal unit 18 of each medical institution 13, it is not a call signal with a usual normal frequency of 16Hz, and a call signal with a specific frequency of 2100Hz is sent out to the information terminal unit 18. And in this case, singing of the ringing tone is not carried out, but automatic incoming connection is carried out with a modem 30.

[0051] Therefore, it is prevented beforehand that the operator who is near the information terminal unit 18 takes up handset 24a accidentally, and answers. Consequently, since the host computer 4 of the emergency medical service information center 1 can collect each information corresponding to emergency from each medical institution 13 certainly, it can improve the dependability of the whole emergency medical information system.

[0052] Moreover, since it is surely a message demand when ringing tone does not sound [as opposed to / for an about 18 information terminal unit / of a medical institution 13 / operator / the polling demand from the emergency medical service information center 1] but ringing tone sounds, a mental burden is mitigated sharply.

[0053] In addition, even if an operator presupposes that handset 24a was taken up accidentally and does during a polling-processing period, change-over circuit 25a will be not a tone signal but the non-signal state from the exchange 11, when it connects with the modem 30 side and handset 24a is applied to a lug. Furthermore, since the polling demand is displayed on the monitor drop 37, an operator can grasp immediately that it is during a polling-processing period.

[0054]

[Effect of the Invention] As explained above, in the emergency medical service information terminal unit of this invention, the frequency of the call signal of the polling demand by the computer is made into the specific frequency other than the frequency of the call signal of the message demand by common telephone. And in the case of a specific frequency, the singing of the ringing tone by polling

demand is stopped automatically.

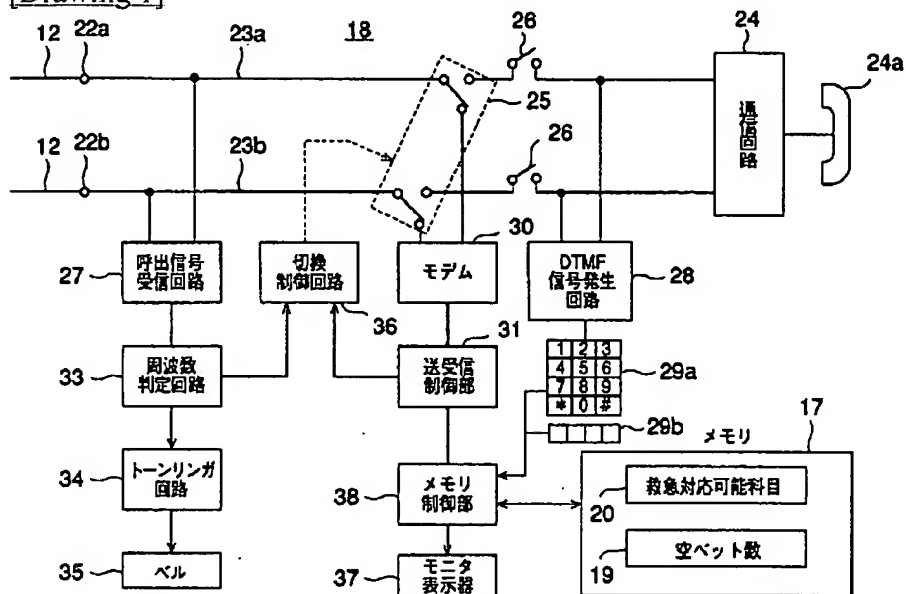
[0055] Therefore, while being able to answer certainly to a polling demand, being able to transmit the information corresponding to emergency to an emergency medical service information center certainly and being able to improve the dependability of the whole emergency medical information system, an operator can answer certainly only to a message demand, and can mitigate an operator's mental burden.

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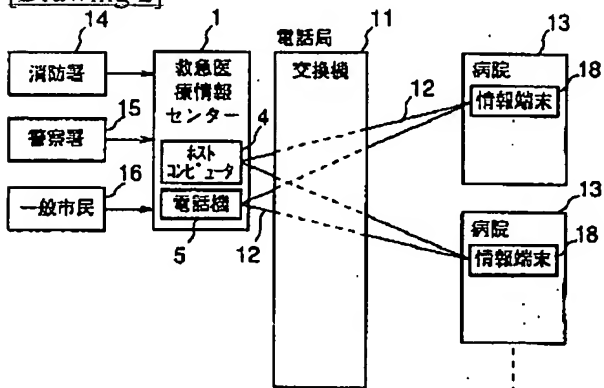
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[Drawing 1]



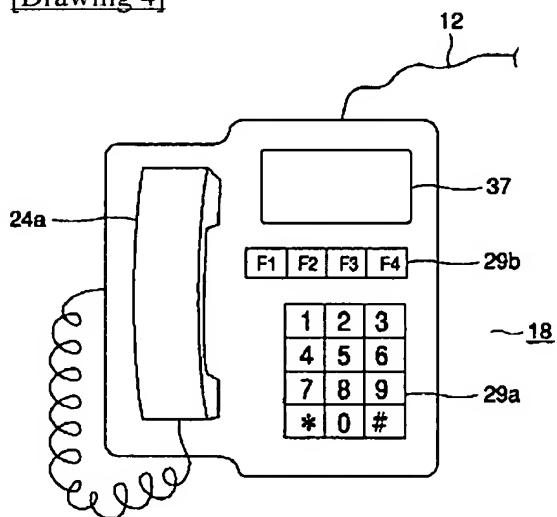
[Drawing 2]



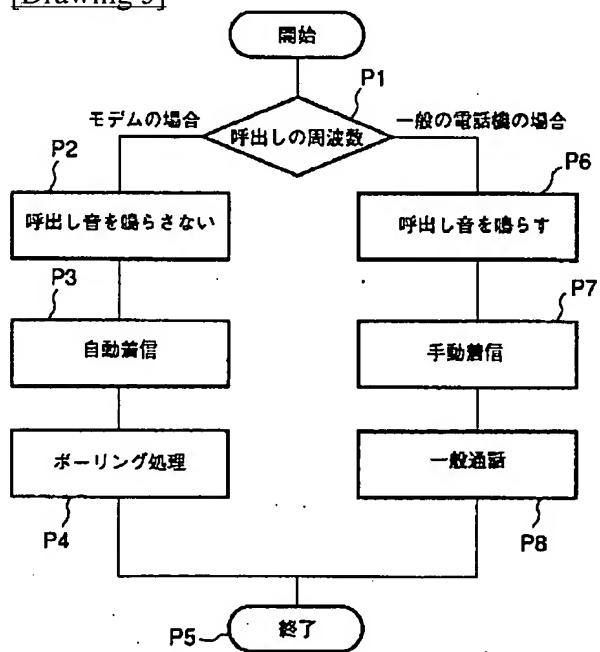
[Drawing 3]

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⋮	⋮

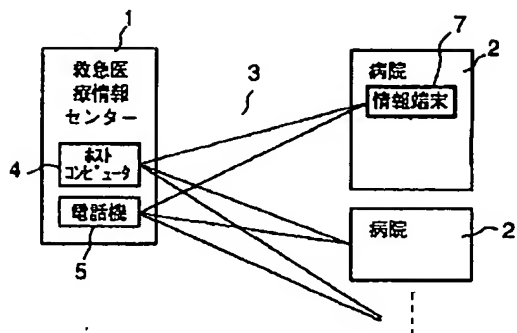
[Drawing 4]



[Drawing 5]



[Drawing 6]



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CLAIMS

[Claim(s)]

[Claim 1] It connects through the telephone line to the computer and telephone of an emergency medical service information center. While carrying out automatic incoming connection of the polling demand through the telephone line from the computer of an emergency medical service information center through a modem and transmitting automatically to the computer of said emergency medical service information center by considering information corresponding to emergency as a polling response In the emergency medical service information terminal unit which performs manual arrival using a speaking circuit according to the message demand through the telephone line from the telephone of said emergency medical service information center The means for switching which switches said telephone line to said speaking circuit or modem, and a call signal receiving means to receive the call signal which received a message through said telephone line, A frequency measurement means to measure the frequency of the call signal received with this call signal receiving means, When the frequency measured with this frequency measurement means is a regular call signal frequency, said telephone line is connected to said speaking circuit side. A line control means to send out the change-over signal which connects said telephone line to said modem to said means for switching when said frequency is a specific frequency defined beforehand, The emergency medical service information terminal unit equipped with a ring trip means to stop the singing of ringing tone when the frequency measured with said frequency measurement means is said specific frequency.

[Translation done.]